

AMENDMENTS TO THE DRAWINGS WITHOUT MARKINGS

IN THE DRAWING:

Figs. 5, 6, 8-13 have been amended.

Figs. 14-16 have been added.

REMARKS

The last Office Action of March 26, 2007 has been carefully considered. Reconsideration of the instant application in view of the foregoing amendments and the following remarks is respectfully requested.

Claims 1-32 are pending in the application. Claims 2-4, 7-9, 13-18, 20-21, 26, 30-31 have been amended. Claims 1, 5-6, 22-25, 28-30 have been canceled. No claims have been added. Amendments to the specification have been made. No fee is due.

It is noted that the drawings are objected to because of informalities and because of applicant's failure to show every feature set forth in the claims.

It is further noted that claim 29 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-3, 5-8, 13-14, 17-20, 22-32 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Pat. No. 5,258,755 (hereinafter "Kuckles '755").

Claims 4, 15-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kuckles '755 in view of U.S. Pat. No. 5,913,820 to Bladen.

Claims 9, 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kuckles '755 in view of U.S. Pat. No. 5,589,775 (hereinafter "Kuckles '775").

Claims 10-12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kuckles '755 in view of Kuckles '775), and further in view of U.S. Pat. No. 6,537,196 B1 to CreightonIV.

OBJECTION TO THE DRAWING

The specification has been amended to include reference characters "6", "m1", "m2", "m3", and to correct the dual use of reference characters "4" and "2".

Applicant submits herewith amendments to Figs. 5, 6, 8-13 to label all elements, as required by the Examiner. New drawing sheets labeled "Replacement Sheet", respectively, are submitted herewith.

In addition, applicant submits herewith new Figs. 14-16, labeled "New Sheet", respectively, to show the subject matter of claim 13. The specification has been amended to make it consistent with the amendments to the drawing. No new matter has been added.

Withdrawal of the objection to the drawing is thus respectfully requested.

REJECTION OF CLAIM 29 UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Applicant has canceled claim 29 so this rejection becomes moot.

Withdrawal of the rejection under 35 U.S.C. §112, second paragraph is thus respectfully requested.

REJECTION UNDER 35 U.S.C. §102(b)

Applicant has canceled independent claim 1 in favor of claim 9 which has been rewritten in independent form. Claim 9 has not been rejected as being anticipated by Kuckes '755 so that a further discussion thereof is not necessary.

Applicant has also canceled independent claim 22 in favor of claim 26 which has been rewritten in independent form, and canceled independent claim 23 in favor of claim 31 which has been rewritten in independent form.

The rejection of previously presented claims 26 and 31 is respectfully traversed.

Both independent claims 26 and 31 set forth a method of determining the location of an instrument by providing a rotating magnet to produce a magnetic moment perpendicular to the instrument axis and by a frequency modulation for variation of the magnetic field generated by the magnet. Kuckes '755 discloses a two-source magnetic field guidance system, using as a first source a permanent

magnet (40) which defines an axis perpendicular to the drill instrument. The second magnetic field source is an axial field source 46 in the form of a solenoid. In rejecting previously presented claims 26 and 31, the Examiner refers to col. 9, lines 35-59 to show the disclosure of a frequency modulation. The Examiner ignores hereby the subject matter of claims 26, 31 which sets forth the frequency modulation of the magnetic field as generated by the magnet which is the same magnet that produces a magnetic moment perpendicular to the instrument axis. In Kuckes '755, it is the solenoid 46 and **not** the permanent magnet that relates to the frequency modulation.

It is well settled that anticipation is not established if it is necessary to pick, choose, and combine various portions of disclosure, not directly related to each other by teachings of reference, in order to find that application claim reads on that reference . Ex parte, BdPatApp&Int (unpub), 12.19/03, 71 USPQ2d 1313.

For the reasons set forth above, it is applicant's contention that Kuckes '755 neither teaches nor suggests the features of the present invention, as recited in claims 26, 31.

Claim 27 which depends from claim 26 and therefore contains all the limitations thereof, patentably distinguishes over the applied prior art in the same manner as claim 26.

Withdrawal of the rejection under 35 U.S.C. §102(b) and allowance of claims 26, 27, 31 are thus respectfully requested.

REJECTION UNDER 35 U.S.C. §103(a)

Applicant respectfully disagrees with the Examiner's rejection of previously presented claim 9 for the following reasons:

Claim 9, as now on file, sets forth the provision of a magnet which, i.a., rotates **independently** of the instrument, and the measurement of a roll angle of the instrument by a variable magnetic field component, which depends on the roll angle.

The Kuckes '755 reference discloses a permanent magnet (40) which is **securely fixed** to the instrument (drill collar 28) so as to rotate conjointly with the collar (cf. col. 5, line 63 to col. 6, line 4). In order to determine roll angle, a pair of inclinometers (64, 64') are provided in the collar 28 (cf. col. 8, line 61 to col. 9, line 5). The provision of the inclinometers is necessary to determine the roll angle when the permanent magnet (40) is decoupled from the instrument and separately rotated (cf. col. 10, ll. 46-50), because of the absence of a relationship between the rotation of the permanent magnet and thus position of the changing magnetic field, one hand, and the rotation of the instrument.

The present invention proposes a different track that eliminates the need of inclinometers but allows a determination of the position, alignment, and roll angle with a single magnetic field source in the instrument by using a magnet that rotates independently from the instrument and generates a magnetic moment by which the position of the magnetic field is defined and which is perpendicular to the instrument axis or rotation axis, and by using an additional variable component of the magnetic field which permits inference from the rotation of the magnetic field to the rotation of the instrument. Thus may be implemented by a reproducible deflection of the magnet from its rotation axis, as set forth in claim 10, or by temporarily interrupting the rotation of the magnet, as set forth in claim 11, or by shifting magnet elements of the magnet with respect to one another by a driver. Reference is also made in this context to paragraphs [0012] and [0013] of the instant specification. As the change is always at a fixed relation to the instrument, a periodic change of the magnetic field permits a determination of the roll angle, even though the magnet rotates independently from the instrument.

With respect to the Kuckes '775 reference, which the Examiner applied in combination with Kuckes '755, it is noted that Kuckes '775 describes a magnet which does **not** rotate independently of the rotation of the instrument. Thus, a combination of Kuckes '755 and Kuckes '775 would not arrive at the present invention but merely result in a determination of the roll angle of a magnet which is in **fixed rotative engagement** with the instrument through evaluation of variations

of the magnetic field. Both references are silent as to a determination of a roll angle in the event the magnet rotates separately.

For the reasons set forth above, it is applicant's contention that neither Kuckes '755, nor Kuckes '775, nor a combination thereof teaches or suggests the features of the present invention, as recited in claim 9.

Claims 2-4, 7-8, 10-21 which depend from claim 9 and therefore contain all the limitations thereof, patentably distinguish over the applied prior art in the same manner as claim 9.

Withdrawal of the rejection under 35 U.S.C. §103(a) and allowance of claims 2-4, 7-9, 10-21 are thus respectfully requested.

CITED REFERENCES

Applicant has also carefully scrutinized the further cited prior art and finds it without any relevance to the claims on file. It is thus felt that no specific discussion thereof is necessary.

CONCLUSION

In view of the above presented remarks and amendments, it is respectfully submitted that all claims on file should be considered patentably differentiated over the art and should be allowed.

Reconsideration and allowance of the present application are respectfully requested.

Should the Examiner consider necessary or desirable any formal changes anywhere in the specification, claims and/or drawing, then it is respectfully requested that such changes be made by Examiner's Amendment, if the Examiner feels this would facilitate passage of the case to issuance. If the Examiner feels that it might be helpful in advancing this case by calling the undersigned, applicant

would greatly appreciate such a telephone interview.

Respectfully submitted,

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